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| S8 | 2 | (optimize or optimized or optimizing or compress or compressed or compressing) with (xaml or "extensible application markup language") | US-PGPUB; USPAT | OR | ON | 2006/03/18 15:40 |
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| S12 | 0 | ("2004/0143823").URPN. | USPAT | OR | ON | 2006/03/18 15:04 |
| S13 | 60 | xul or "xml user interface language" or (("extensible markup language" or xml) near3 "user interface language") | US-PGPUB; USPAT | OR | ON | 2006/03/18 15:25 |
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| S15 | 53 | xul | US-PGPUB; USPAT | OR | ON | 2006/03/18 15:26 |
| S16 | 34 | S15 not S14 | US-PGPUB; USPAT | OR | ON | 2006/03/18 15:26 |
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| S32 | 2530 | (715/513).CCLS. | US-PGPUB; USPAT | OR | OFF | 2006/03/19 13:25 |
| S34 | 53 | xul | US-PGPUB; USPAT | OR | ON | 2006/03/19 13:26 |
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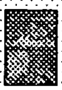
| 1. |  Book<br>**Rapid Application Development with Mozilla™**<br>By Nigel McFarlane<br>Slots: 1.0<br>Table of Contents | 1. Static Content<br>2. Summary<br>3. General-Purpose XUL Attributes<br>More... | Prentice Hall | 2003/11/25 | |
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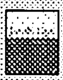
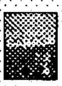
| 4. |  Book<br>**JavaScript™ Developer's Dictionary**<br>By Alexander J. Vincent<br>Slots: 1.0<br>Table of Contents | 1. Other XML Languages<br>2. Description<br>3. Properties<br>More... | Sams | 2002/05/29 | |
| 5. |  Book<br>**Firefox And Thunderbird Garage**<br>By Chris Hofmann, Marcia Knous, John Hedtke<br>Slots: 1.0<br>Table of Contents | 1. Why Are Extensions Created?<br>2. Where Did Mozilla Thunderbird Come From?<br>3. Featured Extensions<br>More... | Prentice Hall | 2005/04/08 | |

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1 Machine translation: Two methods for learning ALT-J/E translation rules from examples and a semantic hierarchy
Hussein Almuallim, Yasuhiro Akiba, Takefumi Yamazaki, Akio Yokoo, Shigeo Kaneda
August 1994 **Proceedings of the 15th conference on Computational linguistics - Volume 1**
**Publisher:** Association for Computational Linguistics
Full text available: pdf(535.62 KB) Additional Information: full citation, abstract, references, citings

This paper presents our work towards the automatic acquisition of translation rules from Japanese-English translation examples for NTT's ALT-J/E machine translation system. We apply two machine learning algorithms: Haussler's algorithm for learning internal disjunctive concept and Quinlan's ID3 algorithm. Experimental results show that our approach yields rules that are highly accurate compared to the manually created rules.

2 Papers: Resolving syntactic ambiguities with lexico-semantic patterns: an analogy-based approach
Simonetta Montemagni, Stefano Federici, Vito Pirrelli
August 1996 **Proceedings of the 16th conference on Computational linguistics - Volume 1**
**Publisher:** Association for Computational Linguistics
Full text available: pdf(547.71 KB) Additional Information: full citation, abstract, references, citings

A system for the resolution of syntactic ambiguities is illustrated which operates on morpho-syntactically ambiguous subject-object assignments in Italian and tries to find the most likely analysis on the basis of the evidence contained in a knowledge base of linguistic data automatically extracted from on-line resources. The system works on the basis of a set of straighforward analogy-based principles. Its performance on a substantial corpus of test data extracted from real texts is described.

3 Poster Sessions: Pattern-based machine translation
Koichi Takeda
August 1996 **Proceedings of the 16th conference on Computational linguistics - Volume 2**
**Publisher:** Association for Computational Linguistics
Full text available: pdf(432.08 KB) Additional Information: full citation, abstract, references, citings

In this paper, we describe a "pattern-based" machine translation (MT) approach that we followed in designing a personal tool for users who have access to large volumes of text in languages other than their own, such as WWW pages. Some of the critical issues involved in the design of such a tool include easy customization for diverse domains, the efficiency of the translation algorithm, and scalability (incremental improvement in translation quality through user interaction). We also describe how ...

4 Papers: Full-text processing: improving a practical NLP system based on surface information within the context
Tetsuya Nasukawa
August 1996 **Proceedings of the 16th conference on Computational linguistics - Volume 2**
**Publisher:** Association for Computational Linguistics
Full text available: pdf(558.88 KB) Additional Information: full citation, abstract, references

Rich information for resolving ambiguities in sentence analysis, including various context-dependent problems, can be obtained by analyzing a simple set of parsed trees of each sentence in a text without constructing a precise model of the context through deep semantic analysis. Thus, processing a group of sentences together makes it possible to improve the accuracy of a practical natural language processing (NLP) system such as a machine translation system. In this paper, we describe a simple c ...

5 Web-based tools, systems and environments: An approach to lightweight deployment of web services
J. Gergic, J. Kleindienst, Y. Despotopoulos, J. Soldatos, G. Patikis, A. Anagnostou, L. Polymenakos
July 2002 **Proceedings of the 14th international conference on Software engineering and knowledge engineering SEKE '02**
**Publisher:** ACM Press
Full text available: pdf(298.73 KB) Additional Information: full citation, abstract, references, index terms

Web Services is gradually becoming the most popular distributed computing paradigm for the Internet. Although several vendor and research efforts are in progress, fully-fledged deployment of Web Services in a wide scale has not been accomplished yet. The present contribution describes a framework for lightweight deployment of Web Services. This framework can be seen as a contribution to a smooth transition step towards a complete large-scale deployment. The paper starts with a description of dat ...

**Keywords:** CATCH-2004, EIRI, HTTP, SOAP, UDDI, WSDL, XML, web services

6 Regular papers: A method for accelerating CFG-parsing by using dependency information
Hideo Watanabe

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1 System papers: advanced interaction tools: Extensible interfaces for mobile devices in an advanced platform for infomobility services
Luigi Mazzucchelli, Matteo Pace
May 2004 **Proceedings of the working conference on Advanced visual interfaces**
**Publisher:** ACM Press
Full text available: pdf(153.04 KB) Additional Information: full citation, abstract, references, index terms

Satellite position based applications, location based information services and communication infrastructures, integrated in Infomobility systems, have had a great influence on the development of new applications in various fields. INStANT, "INfomobility Services for SafeTy-critical Application on Land and Sea based on the use of iNtegrated GNSS Terminals for needs of OLYMPIC cities", is a Pilot Project co-funded by European Commission and GALILEO Joint Undertaking; it aims to provide a scalable ...

**Keywords:** XUL, extensible user interfaces, integrated models for process driven Architectures, mobile devices

2 Computers in education and business: A model for maintaining interoperability of coarse XML sharable Learning Objects after re-authoring in a standards-based editor
Rajendra G. Singh, Margaret Bernard
January 2004 **Proceedings of the winter international symposium on Information and communication technologies WISICT '04**
**Publisher:** Trinity College Dublin
Full text available: pdf(278.82 KB) Additional Information: full citation, abstract, references

Learning Objects are being packaged for interoperability using internationally agreed standards such as the Sharable Content Object Reference Model (SCORM). A course-designer aggregating heterogeneously created Sharable Learning Objects (SLOs) from a repository when challenged with coarse SLOs would find a standards-based editor to be a useful tool for re-authoring if the interoperability of an edited coarse SLO could remain intact after the edits. Further, since many authoring applications are ...

3 Computers in education and business: Development of a scenario based use case contextual model for a banking application from G.D.I. diagram
Jasjit Singh, Ela Kumar, R R. P. Gupta
January 2004 **Proceedings of the winter international symposium on Information and communication technologies WISICT '04**
**Publisher:** Trinity College Dublin
Full text available: pdf(278.83 KB) Additional Information: full citation

4 Evaluating accessibility: Mozilla accessibility on Unix/Linux
Louie Zhao, Jay Yan, Kyle Yuan
May 2005 **Proceedings of the 2005 International Cross-Disciplinary Workshop on Web Accessibility (W4A) W4A '05**
**Publisher:** ACM Press
Full text available: pdf(954.35 KB) Additional Information: full citation, abstract, references, index terms

Web Accessibility (Ally) has been developed in recent years. Till recent days, no web browser on Unix/Linux has Ally support. This means the powerful Unix and the free Linux operating system is unusable by the disabled. People who had a computer, but could not afford $500 for Microsoft Windows, were unable to use his computer. This was the problem we were trying to address by adding Ally support into Mozilla on Unix/Linux. Mozilla was chosen because it's the most important open source cross-plat ...

**Keywords:** ATK, W3C, ally, keyboard navigation, mozilla

5 A GUI for ps(1) built with mozilla
Nigel McFarlane
July 2004 **Linux Journal**, Volume 2004 Issue 123
**Publisher:** Specialized Systems Consultants, Inc.
Full text available: html(31.32 KB) Additional Information: full citation, abstract

Make your apps run anywhere your browser does with the development framework that's already on your desktop.

6 Task-based design: Task models as basis for requirements engineering and software execution
Daniel Reichart, Peter Forbrig, Anke Dittmar
November 2004 **Proceedings of the 3rd annual conference on Task models and diagrams TAMODIA '04**

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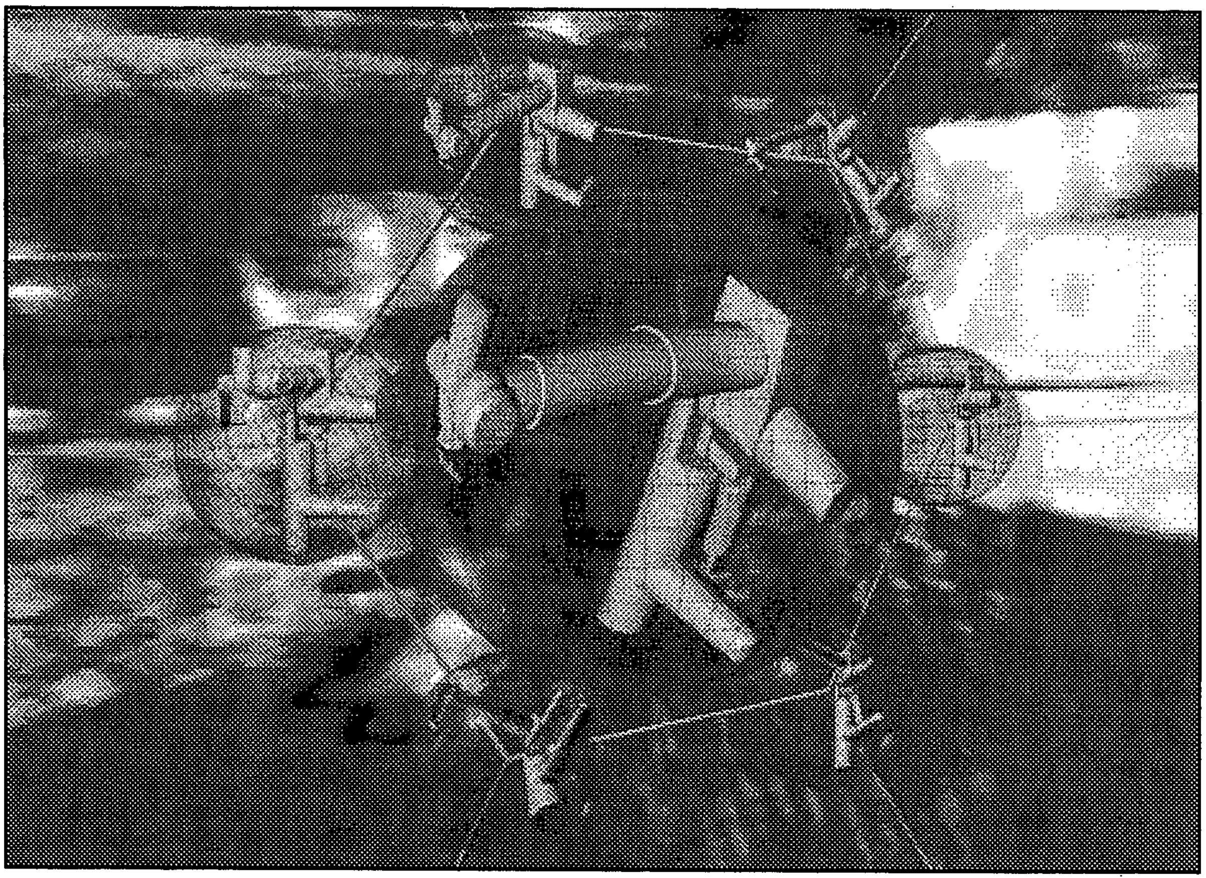
# XMLTalk:

## A framework for automatic GUI rendering from XML specs



By Frank Sauer

User interfaces (UIs) are the most visible and, consequently, the most frequently changed part of any application. Tracking these changes makes client GUI development one of the most labor-intensive parts of system development and maintenance. This is compounded by the industry trend toward personalization, which drastically increases the complexity of GUI development as users may require different views based on preferences or role.

Most of these headaches of GUI development would be a thing of the past if the GUI could be defined by some kind of a specification instead of large amounts of code. This article introduces XMLTalk, an application framework that lets programmers specify the application's UI in an Extensible Markup Language (XML) file, instead of hundreds or potentially thousands of lines of Java code. The framework uses key concepts from both the Java and Smalltalk[1] programming languages to aid in the automatic rendering of UIs using a set of predefined models and widgets.

XMLTalk applications follow the model-view-controller (MVC) paradigm, and both the models and the views are specified in the XML specification. In addition—and this is the *key* to XMLTalk—the connections between the views (widgets) and their models are also specified in the XML. This dramatically reduces the amount of code required to develop UI applications. The models used in XMLTalk are ValueModels, a concept originating in Visualworks' Smalltalk in the early 1980s. The framework contains a number of implementations of this very simple interface, namely ValueHolder, AspectAdaptor, SelectionInList, RangeAdaptor, and others. Complex application behavior can be achieved simply by connecting ValueModel objects

together in various ways. These connections are also specified in the XML specification.

XMLTalk supports the entire range of Swing widgets. Views are laid out using layout managers, such as BorderLayout, GridBagLayout, and others. XMLTalk provides several enhancements to JTable, JTree, and other complex Swing widgets, such as striped tables, tree nodes with individual icons and support for drag and drop, input validation, and field formatting for both input fields and table editors.

Every application developed with XMLTalk becomes a component that can be used in another (or the same) XMLTalk application in the form of a window, dialog, inner frame, tab in a TabPanel, or simply an embedded Panel. For example, an address entry panel can be written once and reused in many applications. Applications provide the framework with an URL to their XML GUI specification, so the XML is not restricted to residing locally on the machine rendering the GUI, but could be obtained from a server where it is generated based on conditions, such as the user's security profile or personal preferences.

The XMLTalk framework contains three key packages: the ValueModel package that implements the various ValueModels; the widgets package, which specializes some of the more complex Swing widgets; and the XML UI builder, which reads the XML specifications and constructs the GUI from it. Applications using the framework extend the abstract ApplicationModel class of the framework and specify where the XML GUI specification can be found by implementing an abstract method defined in ApplicationModel (see Figure 1).

XMLTalk contains a Document Type Descriptor (DTD) that constrains valid content of the UI specifications. (The complete source code for this article is available at the code section of **www.javareport.com.**) The XML GUI builder reads the specification, optionally validates it, and builds the models, actions, and views contained in it. All elements in the specification are named and the builder constructs data structures where these elements can be found by name when they are later referenced from the XML. When the builder is constructing the widgets, it automatically connects them to the previously built models. Application programmers can also find models, actions, and widgets by using those same names in their code.

To get a better understanding of this process, let's examine a simple example application—the Java code, the XML specification, and the resulting UI.

## XMLTalk Application Example

Consider the UI shown in Figure 1. All the sliders, progress indicators, and scrollbars move in a synchronized manner. When you move one, all of the others move with it. In addition, each of these components is constrained by a minimum and maximum value, which can be set by typing them in the input fields labeled "Min:" and "Max:". Typing a value in the input field labeled "Value:" makes all the sliders and scrollbars move to that position. The input field labeled "Extent:" controls the width of the scrollbar extents. (See Listing 1 for the Java code for this application.)

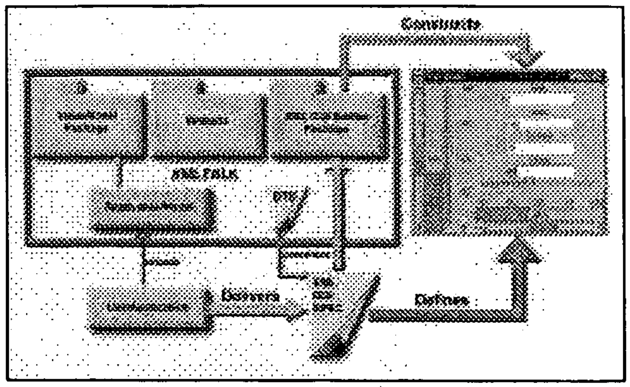


**Figure 1.** *Overview of XMLTalk architecture.*

An independently developed standard Swing version that implements the described behavior contains 230 lines of code and 20 instance variables. How can 10 lines of code in Listing 1 achieve the same functionality? The answer is ValueModels. To explain the concept of ValueModels in more detail, here is an excerpt from the XML specification for the application shown in Listing 1.

```
<MODELS>
  <VALUEHOLDER  name="min"/>
  <VALUEHOLDER  name="max"/>
  <VALUEHOLDER  name="extent"/>
  <VALUEHOLDER  name="value"/>
  <RANGEADAPTOR name="range"
                extentholder="extent"
                maxholder="max"
                minholder="min"
                valueholder="value"/>
</MODELS>
```

This XML code snippet defines four ValueHolder objects

**LISTING 1**

**The complete Java source code for the Slider example.**

```
public class SliderExample
     extends ApplicationModel {

  public static void main(String argv[]) {
     (new SliderExample()).open();
  }

  public void windowClosed() {
     System.exit(1);
  }

  public URL getUI() {
     return
     getClass().getResource(
          "sliderexample.xml");
  }
}
```

and one RangeAdaptor object. The RangeAdaptor object refers to the ValueHolder objects by name. So, what are these ValueHolder and RangeAdaptor objects? They are implementations of an abstract class called ValueModel, which is an invisible Java bean with a single bound property of type Object named "value."

This translates to a ValueModel being an object that has a getValue() method, a setValue(Object) method, and the important capability of firing a PropertyChangeEvent every time the setValue(Object) method is called. This firing of events when the value of a ValueModel changes is one of the most important factors that makes XMLTalk work. Recipients of the event implement the PropertyChangeListener defined in the standard Java JDK (1.1 and up). All ValueModel implementations and widgets defined in XMLTalk implement this interface, which allows them to receive these events.

This event propagation mechanism allows Value-Model objects to be connected together in various useful ways. In the code snippet on page 17, the RangeAdaptor is connected to four ValueHolder objects and is notified each time an object changes its value. On the other side, the ValueHolders are connected to the input fields, and the (single) RangeAdaptor is connected to all other widgets (sliders, progress bars, and scrollbars). These widgets refer to the ValueModels as their model. Because the widgets are connected to the models, they will also receive the PropertyChangeEvents as they occur.

Putting all this together enables the following scenario: A user types the value 40 in the input field labeled "Value:". The input field will set the value in its model, the ValueHolder named "value." In turn, the ValueHolder will fire the PropertyChangeEvent, indicating its value has changed. The RangeAdaptor receives the event and fires an event of its own to indicate its current value has changed. This event is received by all the sliders, progressbars, and scrollbars that make them move to position 40.

Figure 2 shows how all the models and widgets are connected. The blue arrows indicate the associations between the various models and widgets, while the red arrows show the flow of PropertyChangeEvents after the user types the value 40 in the value input field.

Listing 2 is the remainder of the XML UI specification, showing how the widgets are laid out, as well as how they refer to their models.

Java GUI programmers familiar with Swing will recognize most of the attributes in this XML specification as the usual properties one can set on the various Swing widgets. The <CONSTRAINTS> element in every widget specification defines the layout manager constraints that define the layout of each widget within its parent container. In this case, since the <VIEW> uses the <GRIDBAGLAYOUT> layout manager, the <CONSTRAINTS> element contains <GRIDBAG> constraints. Different layout managers will use different <CONSTRAINTS> elements, for example <BORDER side="North"> can be used with a <BORDER> layout manager. In addition to the standard Swing attributes, XMLTalk gives each widget the *model* attribute, which links the widget to one of the models specified in the <MODELS> section of the specification.

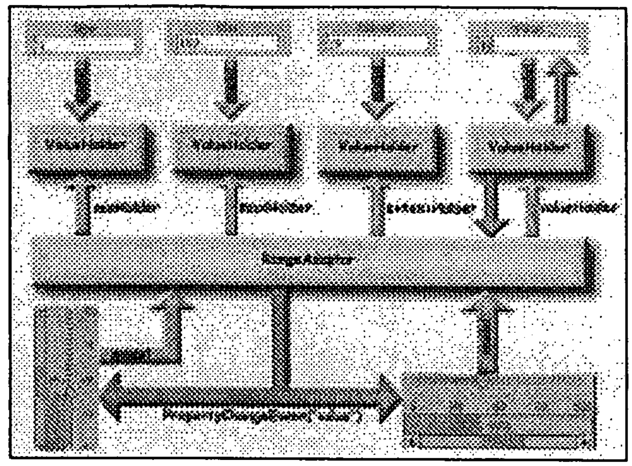


**Figure 2.** *Models and connections for the Slider example.*

Listing 2 demonstrates the powerful concept of connecting very simple ValueModel objects together into more complex models that can drive the entire UI with the application, without requiring a single line of Java code. While developing several applications using XMLTalk, I have discovered several patterns in ValueModel connections that seem to occur in almost every application.

### Connecting SelectionInList to Multiple BufferedAspectAdaptors

A frequent scenario occurs when a user makes a selection in a list of objects, triggering an update in multiple parts of the UI to reflect that selection. One example is a list of persons and a number of input fields displaying first and last names, and middle initial. The user can then edit these values and apply the change to the selected person by clicking an "Apply" button. Similarly, a "Reset" button should undo all the changes and retrieve the original values from the selected person. This entire scenario can be constructed using XMLTalk without writing a single line of Java code to drive this interaction. Let's examine the models needed to implement this behavior in more detail.

**SelectionInList.** With Swing, the JList, JCombobox, JTable, and JTree widgets allow users to select an item within a list of items. With the exception of the JTree, all of these widgets in XMLTalk use the same model, a SelectionInList that aggregates two ValueModels to create a new one. One of the ValueModels—the listHolder—is used to contain the list of items, while the other—the selectionHolder—is used to contain the currently selected item. When users click an item in a Listbox, the SelectionInList will call setValue on its selectionHolder. As a result, the selectionHolder will fire a PropertyChangeEvent. The reverse is also true. When the application changes the value contained in the selectionHolder, the Listbox will react by changing the visible selection highlight. If the application changes the content of the listHolder, the listbox will react by completely repainting itself with the new content and resetting the selectionHolder. Note that the only programmat-

**LISTING 2**

**View definitions for the Slider example**

```
<VIEWS>
  <VIEW name="main" title="Test Slider">
   <LAYOUTMANAGER>
     <GRIDBAGLAYOUT/>
   </LAYOUTMANAGER>
   <SCROLLBAR name="verticalscroll"
             model="range"
             orientation="VERTICAL"
             blockincrement="25"
             unitincrement="5">
     <CONSTRAINTS>
       <GRIDBAG gridheight="REMAINDER"
               fill="VERTICAL"
               weighty="1.0"/>
     </CONSTRAINTS>
   </SCROLLBAR>
   <PROGRESSBAR name="verticalProgress"
               model="range"
               orientation="VERTICAL"
               paintstring="true">
     <CONSTRAINTS>
       <GRIDBAG gridheight="REMAINDER"
               fill="VERTICAL"
               weighty="1.0"/>
     </CONSTRAINTS>
   </PROGRESSBAR>
   <SLIDER name="slider_vert" model="range"
          orientation="VERTICAL"
          labels="true"
          ticks="true" track="true"
          major="25" minor="5" filled="true"
          snap="true">
     <CONSTRAINTS>
       <GRIDBAG fill="VERTICAL"
               weighty="1.0"
               gridheight="REMAINDER"/>
     </CONSTRAINTS>
   </SLIDER>
   <LABEL name="l1" text="Min:"/>
   <INPUTFIELD name="f1" model="min"
              decimalformat="###"
              type="Integer"/>
   <LABEL name="l2" text="Max"/>
   <INPUTFIELD name="f2" model="max"
              decimalformat="###"
              type="Integer">
     <CONSTRAINTS>
       <GRIDBAG gridwidth="REMAINDER"/>
     </CONSTRAINTS>
   </INPUTFIELD>
   <LABEL name="l3" text="Extent:"/>
   <INPUTFIELD name="f3" model="extent"
              decimalformat="###"
              type="Integer"/>
   <LABEL name="l4" text="Value:"/>
   <INPUTFIELD name="f4" model="value"
              decimalformat="###"
              type="Integer">
     <CONSTRAINTS>
       <GRIDBAG gridwidth="REMAINDER"/>
     </CONSTRAINTS>
   </INPUTFIELD>
   <SLIDER name="slider_hor" model="range"
          orientation="HORIZONTAL"
          labels="true"
          ticks="true" track="true"
          major="25" minor="5" filled="true"
          snap="true">
     <CONSTRAINTS>
       <GRIDBAG gridwidth="REMAINDER"
               fill="HORIZONTAL"
               weightx="1.0"/>
     </CONSTRAINTS>
   </SLIDER>
   <PROGRESSBAR name="horizontalprogress"
               model="range"
               orientation="HORIZONTAL"
               paintstring="true">
     <CONSTRAINTS>
       <GRIDBAG gridwidth="REMAINDER"
               fill="HORIZONTAL"
               weightx="1.0"/>
     </CONSTRAINTS>
   </PROGRESSBAR>
   <SCROLLBAR name="horizontalscroll"
             model="range"
             orientation="HORIZONTAL"
             blockincrement="25"
             unitincrement="5">
     <CONSTRAINTS>
       <GRIDBAG gridwidth="REMAINDER"
               fill="HORIZONTAL"
               weightx="1.0"/>
     </CONSTRAINTS>
   </SCROLLBAR>
  </VIEW>
</VIEWS>
```

ic interaction is between the application and the models, using the simple and consistent ValueModel interface. The application programmer is not required to know and understand the API of each individual widget.

**AspectAdaptor and BufferedAspectAdaptor.** Sometimes a widget needs to display only *some* property of an object. This is accomplished by using an AspectAdaptor,[2] which is created with the name of a property (aspect). The AspectAdaptor implements its getValue() method by using reflection to translate the name of the property to an appropriate getProperty method, following the standard Java beans naming conventions. For example, if the AspectAdaptor was created on aspect "firstName," it will call getFirstName() on its subject whenever the getValue() method is called. Similarly, it will call setFirstName (object) whenever the setValue method is called.

Often, a GUI will have several widgets that each display a different part (aspect) of the same subject. To facilitate this scenario, AspectAdaptor has a subjectChannel, which is another ValueModel containing the subject for the AspectAdaptor. Whenever the contents of the subject Channel change, the AspectAdaptor will retrieve the new value for its aspect (for example, by calling getFirstName() in the previous example). It then fires a PropertyChangeEvent to indicate its value has changed. By sharing the same subjectChannel among several AspectAdaptors, an entire GUI can be automatically updated whenever the content of the subjectChannel changes. In the above scenario, all the input fields showing firstName, lastName, and middleInitial will automatically update themselves when a new Person object is stored in the shared subjectChannel.

BufferedAspectAdaptor is a refinement of AspectAdaptor. Instead of directly updating the subject contained in the subjectChannel every time setValue() is called, it buffers the new value until it receives a PropertyChangeEvent from another ValueModel called the "triggerChannel." When the BufferedAspectAdaptor receives the event from the triggerChannel, it gets its value, and when it is Boolean.TRUE, it propagates the buffered value to its subject. When the triggerChannel's value is Boolean.FALSE, it retrieves the original value from the subject and signals to its views that the value has changed. This is used to undo a user's changes. Multiple BufferedAspectAdaptors often share a single triggerChannel, which is triggered by an apply-button or cancelled by a reset-button. This allows multiple changes to be committed to the subject or undone in a single shot.

### Putting It All Together

Now that we've seen the SelectionInList and Buffered-AspectAdaptor models, let's connect them to implement the scenario described earlier. We have a list of Person objects displayed in a Listbox, and every time the user selects one, we want the contents of the firstName, last-Name, and middleInitial input fields to automatically update. In addition, we want to be able to replace the user's changes with original values of the selected Person object. This scenario can be broken down as follows:

- Update the displayed values in input fields when a selection in a list changes.
- Commit or Abort all the changes made in the input fields in a single shot.

The first part indicates we want to use the SelectionInList's selectionHolder as the subjectChannel of the input fields AspectAdaptor models. However, the second part indicates we want to use a Buffered-AspectAdaptor with a shared triggerChannel, and not an AspectAdaptor. Since a BufferedAspectAdaptor is a subclass of AspectAdaptor, we can use a BufferedAspect-Adaptor everywhere we use an AspectAdaptor, so combining both parts results in the following:

- A Listbox has a SelectionInList as its model.
- The selectionHolder of the SelectionInList is the subjectChannel for three BufferedAspectAdaptors.
- The BufferedAspectAdaptors share a single triggerChannel.
- The model for the three input fields are the Buffered-AspectAdaptors.

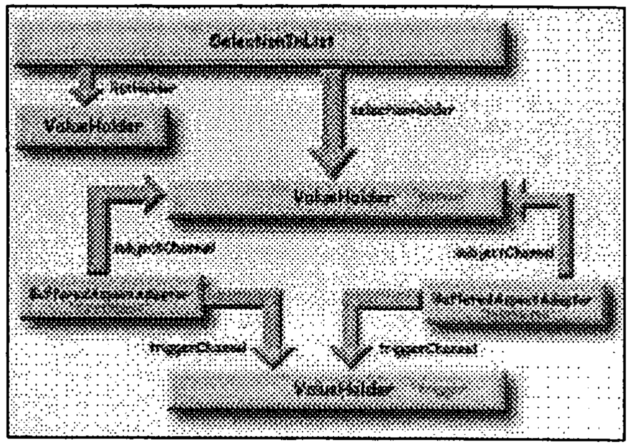


**Figure 3.** *Connecting SelectionInList and multiple BufferedAspectAdaptors.*

Figure 3 illustrates the models and their connections, and Listing 3 shows how this is specified in the XML specification. The application code only has to provide the content for the listHolder of the SelectionInList (implement the getPersons() method). Note that Figure 3 only shows two of the three BufferedAspectAdaptors for clarity.

### ValueModel Promotion

XMLTalk applications are reusable as components of other XMLTalk applications. Ideally, a component being reused should have no knowledge of the enclosing application or other components embedded in the enclosing application. But if components have no knowledge of each other, how then do they communicate with each other? To address this issue, XMLTalk introduces a new

**LISTING 3**

**Example model connections**

```
<MODELS>
   <VALUEHOLDER name="person"/>
   <VALUEHOLDER name = "trigger"/>
   <BUFFEREDASPECTADAPTOR
            aspect="firstName"
            name="firstName"
            subjectChannel="person"
            triggerChannel="trigger"/>
   <BUFFEREDASPECTADAPTOR
            aspect="lastName"
            name="lastName"
            subjectChannel="person"
            triggerChannel="trigger"/>
   <BUFFEREDASPECTADAPTOR
            aspect="mi" name="mi"
            subjectChannel="person"
            triggerChannel="trigger"/>
   <SELECTIONINLIST name="persons"
            selectionHolder="person"
            list="getPersons"/>
</MODELS>
```

concept called "ValueModel Promotion." Let's examine ValueModel Promotion by looking at another example.

An XMLTalk application can choose to promote a ValueModel by specifying the promote="true" attribute of the model specification. For example, a person editor might promote its ValueModel containing the Person object being edited as:

```
<VALUEHOLDER name = "person" promote="true"/>
```

XMLTalk uses this flag to publish the ValueModel to the enclosing application, making it a publicly accessible property of the embedded component. Some other embedded component might be used to select Person objects from a list or table of Person objects. It will promote its ValueModel containing the currently selected Person object as:

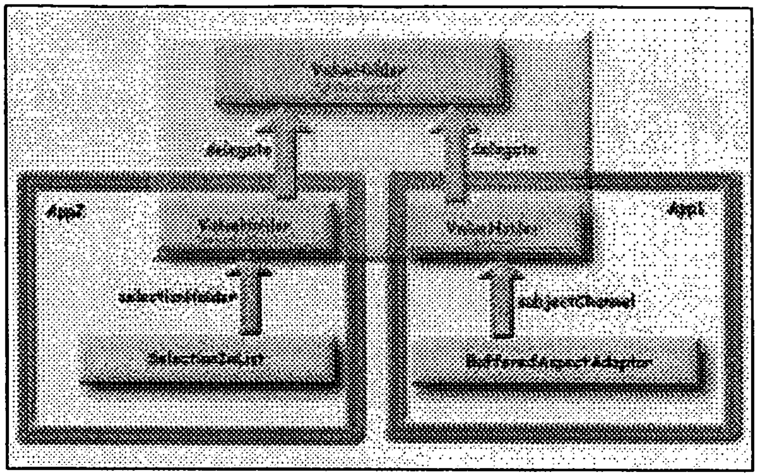


**Figure 4.** *ValueModel Promotion.*

```
<VALUEHOLDER
   name = "selectedPerson"
   promote="true"/>
<SELECTIONINLIST
   name = "persons"
   selectionholder="selectedPerson"/>
```

At this point, the enclosing application has access to two promoted ValueModels. It can now use the delegatefor attribute to connect them together as follows:

```
<VALUEHOLDER
   name="globalPerson"
   delegatefor =
     "app1.person,app2.selectedPerson"/>
```

The value of the delegatefor attribute indicates that the ValueModel serves as a delegate for the promoted "person" ValueModel in the embedded application named "app1" and for the promoted ValueModel named "selectedPerson" in the embedded application named "app2." The result of this connection is that the three ValueModels ("person," "selectedPerson," and "globalPerson") will behave as if they are one and the same ValueModel object. When the value of one of them changes, the value of the other two will change automatically. This allows embedded components to communicate with each other without even knowing that the other one exists. Figure 4 illustrates the idea of ValueModel Promotion.

## Conclusion

XMLTalk enables rapid development of UIs and allows these UIs to be modified without the need for code changes or recompilation of the application code. It promotes reuse of these applications by facilitating component-based development and loose coupling of these components. To use XMLTalk successfully, developers have to acquire a slightly different mindset. They have to think of UI development as "circuit design," as if they are developing a digital circuit using off-the-shelf components. As in circuit design, the behavior of an XMLTalk application is "in the wires" in the way the models are connected to each other and to the UI widgets. With some training and proper documentation, non-programmers can maintain the UI of an application.

XMLTalk applications can be easily deployed to a large number of desktops, while still maintaining centralized control of the UI, if the XML specifications are maintained in a central repository. A change to the UI does not imply a complete redeployment to all the installed desktops, unless actual application code was changed. The bulk of code in an XMLTalk application is the XMLTalk framework itself, which will change very infrequently, if at all. The XMLTalk framework can be deployed once, while applications can be redeployed as needed. However, most changes to the application will consist of changes to the XML specification, which does not require a redeployment of the code at all. I have successfully deployed the XMLTalk framework as an extension to the JRE 1.3 and run XMLTalk applications as applets using the JRE as a plug-in to the browser. Because the framework is installed as an extension to the JRE, the applets themselves are extremely small. Often, entire applications are packaged in a jar of roughly 5KB, smaller than the average image on most Web sites.

## Footnotes and Resources

1. Specifically, the Visualworks Smalltalk user interface frameworks originally conceived by ParcPlace.
2. The name "AspectAdaptor" is Smalltalk terminology. A more Java-centric name would have been "PropertyAdaptor." The author is currently in the process of renaming most of the XMLTalk classes to be accessible to Java programmers.
3. For more information on XMLTalk, visit http://www.trcinc.com.

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